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Interface Control Drawing for JTIDS DDG-69 Shipboard Antenna

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TABLE OF CONTENTS

1.0	SCOPE	1
2.0	APPLICABLE DOCUMENTS	1
	2.1 Government Documents	1
	2.2 Specifications	1
	2.3 Standards	1
	2.4 Technical Manuals	1
	2.5 Drawings	1
3.0	INTERFACE REQUIREMENTS	2
	3.1 Mechanical Interface	2
	3.1.1 Item Definition	2
	3.1.2 Dimensions	2
	3.1.3 Weight	2
	3.1.4 Mounting	2
	3.1.4.1 Mounting Plate	2
	3.2 Electrical Interfaces	2
	3.2.1 JTIDS Electrical Interfaces	2
	3.2.2 Cables	3
	3.2.3 Electrical Connectors	3
	3.2.4 RF Coaxial Connectors	3
	3.2.4.1 RF Coaxial Connection Procedure	3
	3.2.5 Antenna Performance Characteristics	3
	3.2.5.1 Transient Antenna, CA3532, Performance Characteristics	3
	3.2.5.2 Receive Antenna, CA3627, Performance Characteristics	4
	3.2.6 Signal Definition	4
	3.2.6.1 JTIDS Transient Antenna (Transmit or Receive RF) (J1)	4
	3.2.6.2 JTIDS Receive Antenna (RF) (J1)	5



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LIST OF FIGURES

Figure 1	JTIDS receive shipboard-antenna mechanical overview	6
Figure 2	JTIDS transmit shipboard-antenna mechanical overview	7
Figure 3	Suggested mounting plate	8
Figure 4	JTIDS DDG 69 shipboard-antenna installation	8
Figure 5	Antenna field-of-view requirements for receive only	9
Figure 6	Antenna field-of-view requirements for transmit only	9
Figure 7	DDG-69 class topside configuration	10
Figure 8	JTIDS cable running sheets	11

1.0 SCOPE

This Interface Control Drawing (ICD) establishes the mechanical and electrical interface requirements and procedures necessary to install and integrate the Full-Scale Development (FSD) Joint Tactical Information Distribution System (JTIDS) shipboard antenna on a DDG-69 class platform. This ICD will be periodically updated as the interfaces are refined in order to provide a common data reference.

2.0 APPLICABLE DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

The following documents of the issue shown below are a selected listing governing requirements for the JTIDS antenna.

2.2 SPECIFICATIONS

MIL-STD-2036	General Requirements for Electronic Equipment

Specification

MIL-C-39012 Rev. C, 30 September 1982, General Specification

for Connectors, Coaxial, Radio Frequency

2.3 STANDARDS

MIL-STD-1310 Rev. E, 18 August 1987, Shipboard Bonding,

Grounding, and Other Techniques for Electromagnetic Compatibility and Safety

MIL-STD-889B Dissimilar Metals, 7 July 1976

2.4 TECHNICAL MANUALS

SPAWAR Change 3, 4 September 1985, Technical Manual,

0967-LP-627-3000 Operation and Maintenance Instruction,

Antenna Group OE-273(V)/URN and

OE-273A(V)/UR

NOSC TD 1283A Interface Control Drawing for JTIDS Shipboard

Antenna

2.5 DRAWINGS

TBD

3.0 INTERFACE REQUIREMENTS

3.1 MECHANICAL INTERFACE

3.1.1 Item Definition

JTIDS DDG-69 antenna is a collinear array developed by CHU Associates, El Cajon, California. There are two types of antennas used on the DDG-69 class system. There are two receive antennas—Directive Array Antenna, Model No. CA3627 ASSY PN 44854-500 and one transmit antenna—Omni Antenna, Model No. CA3532 ASSY PN 43094-500. The JTIDS DDG-69 antennas operate over the entire JTIDS frequency band (960 MHz to 1215 MHz) without electrical or mechanical tuning. Figures 1 and 2 illustrate the mechanical overview of each antenna. Figure 3 illustrates the suggested mounting plate.

3.1.2 Dimensions

The shipboard antenna envelopes and mounting configurations are illustrated in figures 5 and 6.

3.1.3 Weight

The total weight of the JTIDS Transmit and Receive Shipboard Antennas does not exceed 18 pounds.

3.1.4 Mounting

The transmit antenna, model number CA3532, is located 8 feet above the 010 level and 10 feet from the pole mast on the port side. Two receive-only antennas, model number CA3627, are located beneath the ends of the yardarm at the 07 level (figure 7). The supporting structures for these antennas are TBD.

3.1.4.1 Mounting Plate. Although figure 3 is a suggested mounting plate, an alternative method is allowed if it meets ship safety requirements.

3.2 ELECTRICAL INTERFACES

The electrical interfaces between the DDG-69 shipboard antennas and the JTIDS terminal are shown in figure 4 and are defined in the following paragraphs. Cable running sheets for JTIDS are shown in figure 8.

3.2.1 JTIDS Electrical Interfaces

The JTIDS electrical interfaces, three coaxial transmission lines, connect the DDG-69 antennas to the JTIDS shipboard class 2 terminal. One coaxial line connects the transmit antenna to port 2J2 of the notch filter assembly (NFA) of the terminal. The other two lines connect two receive-only antennas to ports 1J2 and 1J3 of the terminal. The coaxial

lines shall be connected to the antennas by the installing activity using standard shipboard exterior cabling practices. The antennas are fitted with bulkhead connectors appropriate for mating with the JTIDS RF power cable connectors, Type N and designated J1 for this electrical interface.

3.2.2 Cables

The installing activity shall be responsible for RF cables (see section 3.2.6.1.e and 3.2.6.2.e) and for antenna mounting. Cable loss for transmit or receive antennas shall not exceed 2 dB. If the cable type LDF5-50A is used, the cable length shall not exceed 150 feet.

3.2.3 Electrical Connectors

The JTIDS DDG-69 antennas do not require electrical connectors.

3.2.4 RF Coaxial Connectors

The antenna connectors shall conform to sections 3.2.6.1.f and 3.2.6.2.f.

3.2.4.1 RF Coaxial Connection Procedure. To connect Type N plug to Type N jack, remove the 7/16-inch upper bolt/nut pattern on antenna. Install cable (RG-214/U) through center hole of fixture, then fasten. Reassemble antenna to fixture by using bolt/nut pattern just removed.

3.2.5 DDG-69 Antenna Performance Characteristics

3.2.5.1 Transmit Antenna, CA3532, Performance Characteristics

ELECTRICAL

Frequency 960-1220 MHz
Polarization Vertical
Impedance 50 ohms
VSWR 2.0:1 maximum
Gain 2.5 dBi minimum
Azimuth Coverage Omnidirectional
within ±0.5 dB

Zenith Coverage

Beamtilt 5° nominal Half-Power Beamwidth 55° minimum

Power Rating 65° nominal Peak 1 kW,
Average 300 W

Input Connector Type TNC receptacle

ENVIRONMENTAL

Vibration Wind

MIL-STD-167, Type 1 100 knots, maximum,

with 4.5 lbs/sq. ft. ice load

Temperature/Humidity

MIL-E-16400F, Class 2

3.2.5.2 Receive Antenna, CA3627, Performance Characteristics

ELECTRICAL

Frequency

960-1220 MHz

Polarization

Vertical

Impedance

50 ohms 2.0:1 maximum

VSWR Gain

6.0 dBi minimum

Azimuth Coverage

180°

Zenith Coverage

Half-Power Beamwidth

55° nominal

Power Rating

Peak 1 kW, Average 300 W

Input Connector

Type TNC receptacle

ENVIRONMENTAL

Vibration

MIL-STD-167, Type 1 100 knots, maximum,

Wind

with 4.5 lbs/sq. ft. ice load

Temperature/Humidity MIL-E-16400F, Class 2

3.2.6 Signal Definition

The JTIDS DDG-69 antennas provide RF interfaces for all transmitted and received JTIDS signals on the JTIDS-equipped DDG-69 ship. Figure 8 shows the respective Cable Running Sheets for JTIDS.

3.2.6.1 JTIDS Transmit Antenna (RF) (J1)

a. Signal Name:

JTIDS RF Power (Transmit)

b. Signal From/To:

JTIDS Notch Filter Assembly to Antenna

c. Signal Function:

Transmission of JTIDS RF Pulses

d. Signal Characteristics:

Type:

RF Pulse, Unbalanced Coax

XMIT Amplitude:

(a) 200 W (Low-Power Mode)

(b) 1000 W (High-Power Mode) (at 20% Duty

Cycle)

Frequency Range:

960-1215 MHz

e. Cable Type:

(a) Andrew LDF5-50A

(b) RG-214/U

f. Connector Type:

(a) Andrew L45N and L45W

(b) M39012/01-0005

g. Load Impedance

50 Ohms, nominal

h. Voltage Standing Wave

Ratio:

2.0:1

3.2.6.2 JTIDS Receive Antenna (RF) (J1)

a. Signal Name:

JTIDS RF Power (Receive)

b. Signal From/To:

Antenna to JTIDS Receiver/Transmitter

c. Signal Function:

Reception of JTIDS RF Pulses

d. Signal Characteristics:

Type:

RF Pulse, Unbalanced Coax

Frequency Range:

960-1215 MHz

e. Cable Type:

(a) Andrew LDF5-50A

(b) RG-214/U

f. Connector Type:

(a) Andrew L45N and L45W

(b) M39012/01-0005

g. Load Impedance

50 Ohms, nominal

h. Voltage Standing Wave

Ratio:

2.0:1

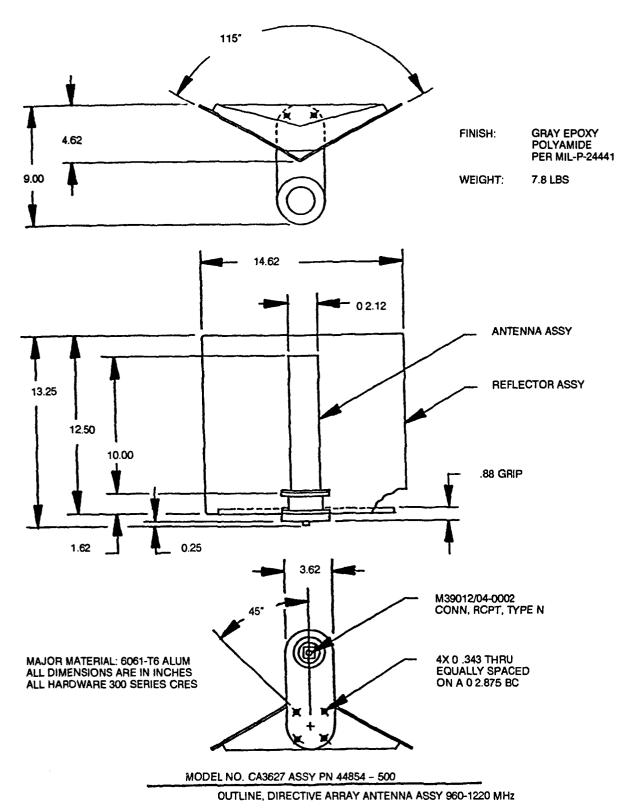


Figure 1. JTIDS receive shipboard-antenna mechanical overview.

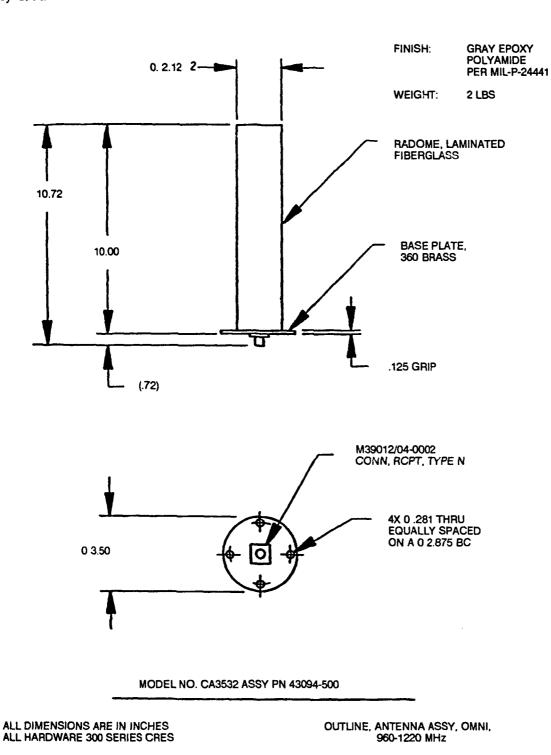
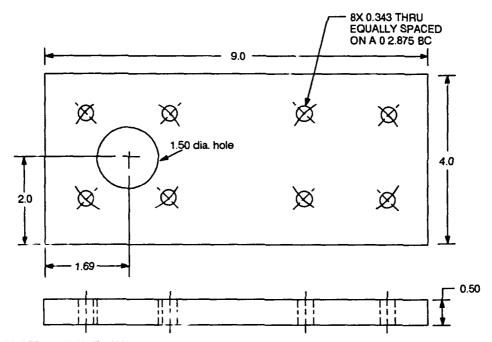


Figure 2. JTIDS transmit shipboard-antenna mechanical overview.



MATERIAL - 6061-T6 ALUM ALL DIMENSIONS IN INCHES NOTES: A)

- FINISH GRAY EPOXY POLYAMIDE PER MIL-P-24441 B)
- **ROUND CORNERS WITH FILE**

Figure 3. Suggested mounting plate.

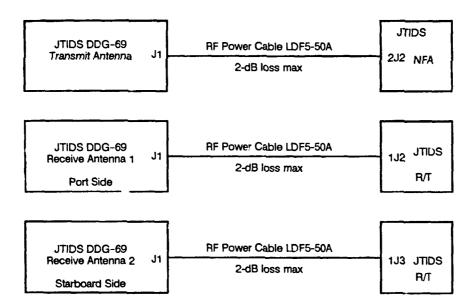


Figure 4. JTIDS DDG-69 shipboard antenna installation.

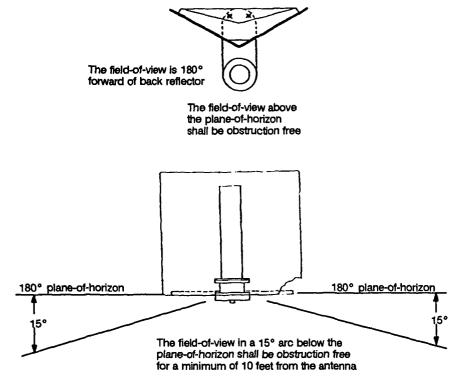


Figure 5. Antenna field-of-view requirements for receive only.

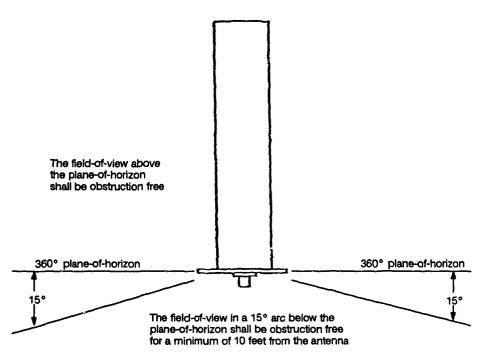


Figure 6. Antenna field-of-view requirements for transmit only.

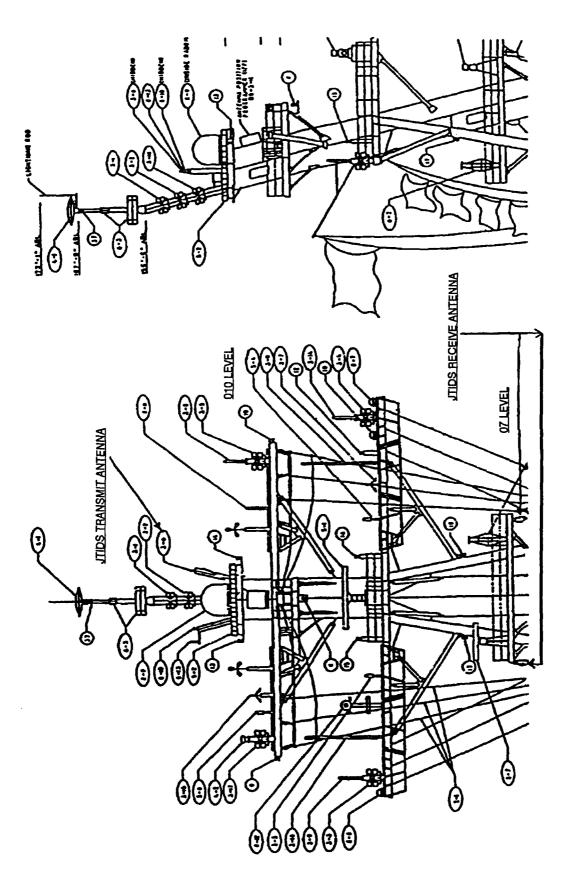


Figure 7. DDG-69 class topside configuration.

CABLE TYPE & SIZE LDF5-50A		ACTIVE WIRES		CABLE DESIGNATION	
	UNIT A			UNIT B	
UNIT NUMBER					
UNIT NAME	JTIDS	JTIDS NOTCH FILTER ASSY.		JTIDS TRANSMIT ANTENNA	
CABLE CONNECTOR	L	5W (ANDREWS)		L45W (ANDREWS)	
UNIT A TERM. NO.	WIRE NO.	COLOR CODE	UNIT B TERM. NO.	FUNCTION	
JTIDS NFA 2J2	1	SEMI FLEX	J1	JTIDS RF TRANSMIT	
		COAX LINE	· ————————————————————————————————————		
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Figure 8. JTIDS cable running sheets (1 of 3).

CABLE TYPE & SIZE LDF5-50A		ACTIVE WIRES		CABLE DESIGNATION	
	UNIT A		UNIT B		
UNIT NUMBER					
UNIT NAME	JTIDS	RECEIVER/TRAN	ISMITTER	JTIDS RECEIVE ANTENNA 1	
CABLE CONNECTOR	L	45W (ANDREWS)		L45W (ANDREWS)	
UNIT A TERM. NO.	WIRE NO.	COLOR	UNIT B TERM. NO.	FUNCTION	
JTIDS R/T 1J2	11	SEMI FLEX	J1	JTIDS RF RECEIVE	
		COAX LINE			
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Figure 8. JTIDS cable running sheets (2 of 3).

CABLE TYPE & SIZE L	E & SIZE LDF5-50A ACTIVE WIRES		CABLE DESIGNATION		
	UNIT A		UNIT B		
UNIT NUMBER					
UNIT NAME	JTIDS RECEIVER/TRANSMITTER		JTIDS RECEIVE ANTENNA 2		
CABLE CONNECTOR	L	45W (ANDREWS)		L45W (ANDREWS)	
UNIT A TERM. NO.	WIRE NO.	COLOR CODE	UNIT B TERM. NO.	FUNCTION	
JTIDS R/T 1J3	1	SEMI FLEX	J1	JTIDS RF RECEIVE	
		COAX LINE			
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Figure 8. JTIDS cable running sheets (3 of 3).

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